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Get Your Modem Runnin', Get Out on the I-way: Encouraging Internet Investigations in the Basic Course¹

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Now, more than ever, students have begun to rely upon the power of the desktop computer and the conveniences it provides when internetworked with other computers. They need only an account and a password to log onto the campus system and can use the access in a variety of productive ways. Students can add or drop classes, view campus news and events, post an intramural sports schedule, use electronic mail to contact a professor or classmate, or search the library's catalog and some of its indexes as well as renew books or submit interlibrary loan requests. In addition, many have begun to appreciate what lies beyond their local networks. The Internet has become increasingly rich with information as well as easy to navigate, and as a result many have taken to the information superhighway, dubbed "I-way" for short.

Professors likewise have increased their reliance upon the internetworking of computers. Many are taking advantage of the opportunities and convenience it provides for correspondence and for locating and retrieving information. They have harnessed the medium to forward teaching and research since materials can be

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exchanged much quicker than via the conventional print medium. Many instructors also have begun to employ the Internet in their teaching; a recent survey found that 24% of college courses include the use of "Web resources" (Guernsey, 1997, p. A30). At the same time, though, those who best understand the Internet view the on-line frenzy with some well-founded alarm, advising caution because of the largely unregulated and disorganized nature of the medium (see Snyder, 1995). Although abundant, high quality, up-to-the-minute information is posted on the Internet, much questionable material also resides there. And while instructors may be comfortable with their own ability to evaluate the integrity of information and discriminate among sites, they remain wary about encouraging students to explore the wilds. Other instructors view the untamed terrain as ideal for testing and improving students' critical abilities. They realize that hitting the "I-way" can yield good results if users employ a few cautions, and they take it upon themselves to teach students to be judicious.

This article shares this latter mind-set, recommending that instructors encourage students to utilize the Internet as *one* of their investigative resources. For colleagues not comfortably acquainted with the Internet, this paper begins with a brief primer on the nature of the I-way and an overview of some of the resources available and how to utilize them. Next, the paper discusses how instructors can help students learn to proceed responsibly, and it introduces a few assignments instructors might use to encourage students to investigate via the Internet.

TRAVELING THE I-WAY

"Net," abbreviated from "Internet," refers to the internetworking of computers from around the world. In the past few years the Internet has grown exponentially, with new sites appearing every minute, adding to the millions already there. Organizations, companies, corporations, agencies, schools, colleges, universities, libraries, repositories, interest groups, politicians, and countless individuals have scrambled to establish a presence (see Andrews & Herschel, 1996). Hence, on the Internet the user can encounter information and opinions on almost any topic imaginable and not only in textual form but also in images, sound, and video.

Locating and Retrieving Information On the World Wide Web

Cyberspace, once completely unmapped and mysterious, remained inaccessible to all but those with specialized skill and knowledge. In the past few years Cyberspace increasingly has become more user-friendly. Among recent innovations was the creation of the World Wide Web and advanced, yet easy to use, Web browser software (such as Netscape and Internet Explorer) for exploring and retrieval. To locate information for a speech topic, the user can proceed in a variety of ways. One might locate information by conducting a keyword search, by exploring various links between pages and sites, or by traveling directly to a page if the address is known.

When starting from scratch, with no information or leads about particular sites, the user could begin with a search — usually an option on the menu bar. Any of sev-

eral popular Web databases, such as Infoseek, Excite, Lycos, Yahoo, and Magellan, can connect the user directly to on-line newspapers and magazines, agencies and organizations, and more. In addition, each database is searchable. To initiate a search, the user will simply enter in the designated bar a key word or two that best describes the subject. For example, if one is interested in Ozone depletion and the severity of the damage, he or she could enter "ozone layer hole." Once the user has designated the term or terms, a search engine will go to work, scanning an index of sites that have titles or abundant information that matches the key word or words you have supplied. In a matter of seconds it will return a listing of Web pages. Once the list appears, the user will simply scroll through it and click on any entries that appear promising and will then travel directly to that site or file. To return to the list, the user will simply click on the appropriate menu button to go back. To return to the menu of Web databases, the user would likewise just keep clicking the way back.

To conduct an effective search on the Web, users need to be aware of a few factors. For one, they must be mindful that search engines often provide a superficial view of what might be available and often return an incomplete listing of its findings. Each of these engines use different criteria for a search and will return information based upon that criteria. As a result, each searching mechanism will generate a somewhat or completely different list. Hence, if one engine does not produce the hoped-for results, the user should launch one from another database. To obtain the best results, the user should use several different search engines. The user might also vary the keywords, using the same engine to search a new term or terms. The user should keep in mind that merely retrying the same descriptors with the same engine will not yield new results, at least

not so long as the sites or files that are available remain the same. Sites or pages which disappear obviously will not make the list again, and new sites or files that appear may better match the criteria used by the engine and thus make the list and bump off one that appeared previously. This manner of searching by key word or words can prove effective. Users simply need to proceed by trial and error.

As an alternative to the search engine, users may wish to explore the Internet via subject directories. Many on-line databases (such as Yahoo) provide this alternative, categorizing — by subject — various Web pages. Users simply click on a subject, and direct links to numerous, relevant sites will appear (see Reddick & King, 1996).

Similarly, users can search for relevant information via links that they encounter on any given Web page. Links are a central component of the Web. Web Space is governed by HyperText Transfer Protocol (HTTP), and documents on the Web are written in HyperText Markup Language (HTML). Within a Web page the user will find hyperlinks — highlighted words and phrases that, with a click of the mouse, establish a link to another file or site. A page also may contain hypermedia, graphical buttons or image maps, which contain links to other files and other sites. Because of this format, users often read a little from a file and then click their way on to another locale. Authors of Web pages understand this form and write accordingly. They assume that a user will not read an entire page from top to bottom but will consult the page for some specific information and then move on to another segment or site suggested by a link, and then on to another, and so on.

Links may lead to sites that prove fruitful. Keep in mind that every file has its own unique Uniform Resource Locator, or URL, which will enable you to return

directly to that particular file without having to retrace your steps and travel through various layers; you can simply use the Open Location command and enter the URL. To maximize efficiency, most software will allow the user to record a URL via a simple command, often called a bookmark. The user will want to establish a bookmark (via the menu bar) for each file that is valuable, or else jot down the URL that is indicated on the "Show Location" line. Users should keep in mind that the URL is bibliographic information they will need in their list of references.

The Uniform Resource Locator provides another way to investigate a topic. If one obtains the URL of a particular Web site that likely will have relevant information, he or she can travel there instantly, as described above, by using the Open Location command and entering the URL. For example, if one wished to know the latest figures for the incidence of diabetes to develop a speech, she or he could visit the Web pages of the American Diabetes Association, located at <www.diabetes.org>. In addition to what information they provide, their Web pages can help the user access information about various local incidence rates because the site features links to the Web pages of agencies and organizations in states throughout the country.

Most URLs are kept simple, as in the example above, so that users can better remember the address or so that they might be able to guess what it may be. Sample Web page addresses include:

- American Cancer Society = <www.cancer.org>
- United States Department of Transportation = <www.dot.gov>
- Federal Bureau of Investigation = <www.fbi.gov>
- The Centers for Disease Control and Prevention = <www.cdc.gov>

As these examples illustrate, finding quality information on the Internet is easy and requires only a few, simple keystrokes.

Advances in software not only assist in locating information, they simplify its retrieval and use. Since the information is sent to one's computer and stored on the clipboard, the user may have the option to save it to a file on the hard drive or a floppy disk, cut and paste it into a word-processing document, or to send it to his or her own e-mail address. Options and procedures will vary, but the computer support personnel at one's school should be able to advise and instruct on the process. Students using a computer in a lab will not want to save permanently to the hard drive but to their own floppy disk or else e-mail the file to their e-mail address.

Other Means for Connecting, Locating, and Retrieving

Two other principal tools that users may encounter are Telnet and FTP. Usually these operate in the background of a Web browser, but a user may have to use them directly to locate and retrieve information as the user researches a topic. Telnet is an application that allows a user to connect with a remote host and view the information available there. For example, a library's system may allow users to "telnet" to the catalogs of other libraries who have their catalogs on line. Similarly, the campus system may allow users to "telnet" to various databases, such as the Educational Resources Information Center (ERIC). What is available will vary from school to school. Once one arrives at a Telnet host, it likely will present files of text material that are organized by directories and subdirectories. The user will simply have to work through the menus, exploring what

is available. Rather than having the luxury of a bookmark utility, the user will need to keep track of how she or he proceeded, recording the choices made while exploring the various menus. If the user wished to explore other remote sites, the local system might have Hytelnet, which provides a subject directory of various Telnet sites and can help connect with their host.

FTP (File Transfer Protocol) is a method for retrieving a file from a distant host that, like Telnet, usually operates unnoticed in the background of the user's browsing software. There may be an occasion, though, where one needs to use FTP to retrieve a file from a remote site. Whereas the process used to require substantial know-how, it has been simplified by various user-friendly programs. Often a file is compressed for transfer. If so, the user will need to decompress it before he or she will be able to use it. Again, various programs exist that simplify the process. The user will simply need to contact the local computer support personnel for assistance.

SUGGESTED TRIPS: LIBRARIES, VENDORS, AND PUBLISHERS

Some areas of the Internet are more reliable than others, such as sites established and maintained by libraries, vendors and publishers. The American Library Association reports that "most college and university libraries, many public libraries, and some school libraries" (Whiteley, 1994, p. 23) have placed their catalog and other databases on-line, though access to the latter may be limited to cardholders.

On-line availability benefits libraries and users alike. Libraries will require fewer electronic workstations and, hence, will conserve money and space. Users

can search and print out findings at their home or office — a convenience that can allow them to spend less time en-route to the library and more time searching for materials. Even though an investigation for relevant information may be conducted from a remote location and even though they may even be able to retrieve a number of documents electronically, users likely will need to spend some actual time at the library because a lot of materials remain available only in print form. For this reason, instructors must help students become comfortable with both virtual and physical visits to the library; today's "tour" of the library will acquaint users with both.

In addition to what is available on-line from libraries, a number of vendors offer on-line information and services. Vendors, such as CompuServ, offer access to professional and scholarly databases as well as e-mail. Subscription and/or use fees vary (see Whiteley, 1994). If one does not have access to a library's databases on-line, a vendor might provide an attractive alternative.

Publishers also have taken to the Internet. The *American Journalism Review* reports that "more than 3,600 newspapers now publish on the Internet" (Meyer, 1997, p. 1), though what appears may or may not be as comprehensive as a print counterpart. Newsmagazines, too, commonly publish on the Internet, though — as in the case of newspapers — what appears may be significantly abbreviated in comparison what may be published in print copy. Nonetheless, what appears may be useful information as one investigates a topic.

(such as Newswatcher) exists to help users locate a relevant group and read their various postings. In addition, a search engine occasionally may suggest a news group and provide a hyperlink to the group's discussion site. Mailing lists, also known as Listservs, are available via subscription (often at no fee). As with news groups, mailing lists exist for a variety of topic areas, and subscribers will receive every mailing to the list. Any message a subscriber sends to the list will be mailed to every subscriber.

News groups and mailing lists can assist in a number of ways. If a student is having trouble finding a specific focus for a general topic, a relevant group/list may help the student discover what would be a viable and timely subarea. Several subtopics may appear, any of which might set off an ongoing dialogue. For example, a news group named "talk.environment" recently posted messages concerning the legality of logging in ancient forests in the West — a good focus for a speech exploring an environmental issue. In addition to helping the student sharpen her or his focus, postings might reveal helpful sources. Contributors to the dialogue often supply the URL to a relevant site or the e-mail address or regular postal address for a relevant agency, official, or expert whom the reader can contact for information and assistance.

When the student discovers a group/list that discusses matters pertaining to his or her topic, the student can simply monitor the dialogue or can post an entry. Any postings requesting information likely will obtain the better results if the request is revealed in the title or in the first few lines of the entry. In addition, instructors might advise students to present, in brief, what they know thus far about a subject and what remains unknown or not fully understood. As one author explains, "If you look like you've done your homework

and are trying to get answers to some final questions, you're likely to get a better reception than if it looks like you're too lazy to go to the library" (Snyder, 1995, p. 130). To ensure that a response is reliable, the solicitor might request, within the query, that respondents suggest relevant readings or Web sites. The scholarly merit of their suggestions will reveal a lot about their own expertise.

EYEING THE GAUGES

It is wild and untamed. It is a place where anything goes. The Internet provides both high-quality materials as well as low-quality materials. Other professors note, similarly, that the Internet contains "a great deal of useless information" (Wilkinson, Bennett, & Oliver, 1997, p. 52). In addition to "useless" information, some information may be harmful. For example, with regard to sites about cancer, Elizabeth Gomez, Registered Nurse and editor of *ONS Online* (1997) warns: "Many of these sources are authoritative and reliable; others, however, are well-intentioned but misinformed, while still others may deliberately mislead the user" (p. 9). Hence, users have to be wary. This wide range of quality is a chief concern among professors and librarians. Editors and librarians serve as gatekeepers for what is housed in libraries, but no gatekeepers exist for the whole of the Internet. The user is on her or his own. Therefore, students need training in evaluating materials on the electronic highway critically.

Users can employ a few simple tests to evaluate what they encounter. These tests include evaluations of accuracy, completeness, recency, and reliability. To be judged as accurate means that the information is redundant and verifiable. In other words, one should dis-

cover essentially the same factual or statistical information from several independent sources. To consult several independent sources would suggest whether the information had been acquired via a thorough inquiry. If so, one could deem it complete. To be judged as recent, which may be vital for some subjects, one would need to be certain that the information is current. The date the page was created or updated is one sign, but the user also would want to consult other sources to gain more assurance that the material is up-to-date. To be considered reliable, one should be able to judge the source as objective, trustworthy, and competent.

In addition to discussing these general concerns with students, an instructor may wish to provide specific directives akin to the following:

First, select sources that provide as much of the following information as possible:

- name and title/position of author(s)
- organizational affiliation of author(s)
- date the page was created or updated
- how to contact the author

Next, apply the usual tests for information quality, including:

- Does the source seem credible, such as having the relevant credentials?
- Is the source affiliated with a credible organization?
- Is the content consistent with that of other credible sources?
- Does the source provide links to other relevant, credible sites?
- Is the information up-to-date?

- Do claims reflect balanced, well-reasoned argument?
- Does the source provide a one-sided view or do they acknowledge other views?

DRIVER'S TRAINING: ASSIGNMENTS FOR STUDENTS

The following collection of assignments include assignments for evaluating and citing information encountered on the Internet, for investigating contemporary or historical topics, for investigating and analyzing the properties of historical and contemporary speeches, and for exchanging information and ideas with others researching or contemplating the same topic.

Assignment One

An instructor could have students visit Internet sites regarding evaluating sources on the Internet and compare their instructions with those offered in the textbook regarding tests of source material. Many quality sites exist, often created and posted by librarians on their library's Web pages. For example, Purdue University (Brand, 1988) and the University of Texas both offer this assistance (see References for the URLs). Individuals also have created helpful on-line information. Harris (1998), at Southern California College, for example, has created an impressive Web page that provides helpful guidelines. Students could visit these or similar sites and report their findings in a brief written and/or oral report to the class. The instructor could then create a master list of guidelines, supplementing what is offered in the text with what students found on the

Internet. The instructor might even post the newly-compiled set of guidelines on her or his Web pages.

Assignment Two

The instructor could devise an assignment on her or his Web pages where students are to explore and critique (in writing) various sites for which the instructor has set up links. The instructor might, for example, list a set of topics and for each topic provide links to three or more relevant sites. The sites could vary in terms of whether biased or more objective, dated or recent, or authored by an expert versus others by authors of questionable expertise. For illustration purposes, an instructor might even wish to retain any dead links. A dead link would reveal the fluidity of the I-way: What is available one moment may disappear the next.

To simplify submission of the assignment, the instructor may wish to set up a Web page for each set of URLs that serves as a "form" for the students to complete. Beneath each URL the student could enter his or her critique and simply e-mail it to the instructor. (Note to Instructors: Electronic submissions guarantee that the assignment will be typed!)

Assignment Three

As an addition to assignment two, the instructor might also require students to locate and critique additional sites relevant to the particular topic they chose in assignment two. Students would submit the complete URL along with their critique of the site. If submitted electronically, programs such as Netscape Mail automatically convert the complete URL to a hyperlink, al-

lowing the instructor to travel directly to the site referenced so she or he can evaluate the student's critique. The instructor can add his or her comments, along with the grade, and e-mail the appended file back to the student.

Assignment Four

For reasons mentioned earlier in this paper, students would do well to explore relevant news groups and mailing lists. Hence, an instructor might have students visit a news group to inventory the issues being discussed as well as to evaluate the integrity of various contributions. The student could copy and paste select contributions into an e-mail to the instructor, along with a brief critique of the quality and importance of each contribution, utilizing the same criteria described above.

Instructors will need to consult their school's computer center or departmental computer lab's personnel to determine what software is available. The instructor might wish to spend a few moments trying it to see how it works and to find a current example or two to print out and/or post to her or his Web pages to show students.

Assignment Five

As a modified version of assignment four, an instructor might have students post an inquiry to a group or list, after monitoring the dialogue for at least one week. The instructor might remind students to do so politely and thoughtfully (and along the lines of what has been

suggested above), so to observe what some have labeled "netiquette."

Assignment Six

Instructors may encourage students to conduct a mini-interview via e-mail. To do so, the student would simply e-mail a quick question or two to a relevant source. Students could copy and paste the reply into an annotated bibliography as well as paste any line they wish to quote into the text of their speech. If students e-mail an inquiry to an agency or organization via its Web pages, they should be prepared to wait longer for a response than if they had e-mailed a particular individual.

Assignment Seven

If students are using sources found on the Internet, the instructor would do well to have students submit the bibliography for their projects via e-mail (along with a hard copy attached to the formal outline of the speech, should the instructor so desire). If submitted electronically, as explained above in assignment three, the instructor may be able to travel directly to any Web page that is cited. In this manner, the instructor will be able to view the consulted site firsthand and with ease.

Assignment Eight

In order to monitor students' progress with research (and to encourage them to get an early start!), instructors might have students submit a brief bibliography indicating their research-in-progress. If submitted elec-

tronically, instructors can type quick feedback about the progress seen, as well as travel to any Internet sources listed. To encourage students' thinking about their speech, the instructor may wish to have students provide a quick annotation about how each entry contributes to their speech and how they can integrate the material.

Assignment Nine

Instructors may wish to have students investigate how to format references so to be accurate and complete. Various Web sites exist to assist students, including pages for APA and MLA styles:

- APA = <www.apa.org/journals/webref.html>
- MLA = <www.mla.org/main_stl.htm#sources>

Several other sites exist that one often can locate via a search engine.

Assignment Ten

If an instructor wished to establish a forum for his or her class (or groups within the class) to discuss their findings or thoughts about a particular subject under investigation, the instructor could set up a listserv which (as explained above) is a mailing list that allows e-mail from an individual to be read by many people. The instructor would simply contact the school's computer center to set up one or more lists (depending whether the instructor wanted only one for the entire class, and/or ones for students working on group projects). An instructor might even work cooperatively with

colleagues at other colleges or universities so that the class could interact with students and professors at one or more other institutions. Towards the end of the term, each class could post a group photo so each class could "meet" their virtual classmates.

Set-up is simple. Once the list is set-up, each student will simply need to send an e-mail to subscribe, following a set of simple guidelines. Once they have subscribed, they will use the service as they would any other e-mail, but the nature of the communications would primarily be task-related. Instructors, of course, will also want to subscribe so they can monitor the discussion as well as contribute from time to time, just as they might monitor and intermittently enter group activities in the classroom. Individuals at a distant location likewise would need merely subscribe.

Used in this manner, the listserv can save valuable class time, promote ongoing reflection and creative exchange about a topic, as well as enable people to "meet"/participate at a time best-suited to their individual schedules. In addition, instructors might wish to have students evaluate how the listserv affected their endeavors in terms of its usefulness, and so on.

Assignment Eleven

If you wish to have your students explore what has been said, historically, about a given social issue, or if you wish to have them investigate how successful speakers have crafted a speech, you could have them visit one of many collections of public discourse that are available on the Internet. One of the best collections is Northwestern University's "Douglass Archives of American Public Address" — named after Frederick Douglass (<<http://douglass.speech.nwu.edu>>). Users can

search the collection by speaker, title of address, or by controversy/movement. Users also can explore the collection chronologically. In addition to featuring various examples of American oratory, it also contains related documents, enabling students to investigate the context surrounding the discourse.

Assignment Twelve

An instructor could have students evaluate an important sample of current public discourse, such as a State of the Union address, by posting it on his or her Web pages. Contemporary public discourse is posted widely on the Internet. In the case of the State of the Union address, one can find it via <www.whitehouse.gov>. In addition, listservs such as CRTNET (accessible via e-mail subscription at <crtnet@lists.psu.edu>), often post complete texts of contemporary public discourse. As with assignment ten, students could post their reactions and criticisms to a listserv for their class and any other participants. Postings should be kept brief. If more than one class is participating, each class might post its overall critique for the other classes to view. On-line and in-class discussion could follow.

Assignment Thirteen

An instructor might modify assignment eleven so that students view (or locate on their own!) a speech which illustrates a particular principle of effective speaking that is discussed in the textbook and/or in class. For example, if the instructor is providing a speech that models visualization, she or he might have students view Martin Luther King's "I Have a Dream."

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